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‘Zi Yuanwu’: A New *Iris sanguinea* Cultivar

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Iris sanguinea, a perennial herb of the Iridaceae family, has become a valuable ornamental germplasm resource in high-latitude regions due to its distinctive butterfly-shaped flowers exhibiting blue-purple pigment. The flower colors and morphologies of *Iris* varieties exhibit exceptionally rich diversity, representing one of the most striking characteristics of this genus and serving as the key criterion for distinguishing different varieties. This diversity is exemplified by specific cultivars: the outer perianth of ‘Donglin Zi’ (Yang et al. 2022) features purplish-red (RHS 85A) and white edges (RHS NN155B); ‘Qihuan Zi’ (Fan et al. 2022) displays a mixture of three colors at full bloom; ‘Donglin Yixia’ (Shi et al. 2024) shows pronounced chromatic differentiation between its outer and inner tepal whorls. Notably, the drooping angle of the outer perianth in ‘Donglin Ziwan’ (Yang et al. 2025) ranges from 45° to 60°.

As pivotal determinants of ornamental merit, floral chromatic characteristics and morphological architecture remain primary selection criteria in contemporary *I. sanguinea* breeding initiatives. In 2017, we discovered a new cultivar of *I. sanguinea*, Zi Yuanwu, which has a significantly larger inner and outer perianth and is consistently dark purple in color (RHS 77A). In addition, the outer perianth of ‘Zi Yuanwu’ has a 90° droop, which was different from the varieties reported recently. The distinctive floral coloration and morphology of ‘Zi Yuanwu’ significantly elevate its ornamental merit.

Origin

In 2003, seeds of *I. sanguinea* and *I. sanguinea* f. *albiflora* were introduced to the Shenyang Botanical Garden and planted in the nursery of the Northeast Forestry University. In Autumn 2011, hybrid seeds were collected from crosses using *I. sanguinea* as the maternal parent and *I. sanguinea* f. *albiflora* as the paternal parent. In 2014, F1 plants were screened, and an exceptional individual—a significantly larger inner and outer perianth and is consistently dark purple in color (RHS 77A)—was identified among the open-pollinated offspring. Morphological traits remained stable for 2 consecutive years. This new cultivar was officially named Zi Yuanwu and registered under authorization by the American Iris Association, with the accession number DBLYDX-ZYW-2019-01.

Description

The trial was conducted at the Nursery of Northeast Forestry University (45.72°N, 126.63°E) in Harbin, China. During the growing season (May to September), a block experiment was implemented for the plants. The soil type was black soil, managed through sprinkler irrigation (two to three times per week) and organic fertilization. ‘Zi Yuanwu’ and its parent lines (30 plants each) were planted in a completely randomized block design with three replications. Flower color was measured using the Royal Horticultural Society (2007) color chart. Fifteen randomly selected plants per block were assessed using fully opened flowers. The data were analyzed by one way analysis of variance using the IBM SPSS Statistics 26.0. The statistical results are shown in Table 1.

The cultivar Zi Yuanwu exhibited a plant height of 59.28 ± 0.15 cm, significantly higher than *I. sanguinea* (56.64 ± 0.15 cm) and *I. sanguinea* f. *albiflora* (57.44 ± 0.15 cm). However, its leaf length (56.07 ± 1.65 cm) was lower than those of *I. sanguinea* (57.91 ± 0.82 cm in leaf length) and *I. sanguinea* f. *albiflora* (56.39 ± 0.61 cm in leaf length), and the difference in leaf width was relatively small. Flower color further distinguishes ‘Zi Yuanwu’ (Fig. 1A–C): Its purple perianth (RHS 77A) contrasts sharply with the bluish-purple of *I. sanguinea* and white of *I. sanguinea* f. *albiflora.* Conversely, the bract of ‘Zi Yuanwu’ (1.04 ± 0.16 cm in bract width) is wider than those of parents. Similar to its parents, ‘Zi Yuanwu’ possesses three inner perianth, outer perianth, pistils, and stamens (Fig. 1D–F).

Notably, its inner perianth segments were significantly larger than those of *I. sanguinea* (length: 4.37 ± 0.07 cm; width: 1.47 ± 0.12 cm) and *I. sanguinea* f. *albiflora* (length: 4.54 ± 0.08 cm; width: 1.48 ± 0.06 cm), measuring 5.47 ± 0.13 cm in length and 3.14 ± 0.08 cm in width. The same trend was observed in the outer perianth segments, which is a hallmark feature distinguishing ‘Zi Yuanwu’ from its progenitors. The flowering and fruiting periods of ‘Zi Yuanwu’ are similar to its parents with flowering time from 5 Jun to 25 Jun, and fruiting time from 10 Aug to 20 Sep.

In summary, ‘Zi Yuanwu’ exhibits distinctive coloration and larger flowers compared with its parental lines. This new cultivar serves as an excellent cut flower.

Cultivation Techniques

The new cultivar Zi Yuanwu exhibits strong cold tolerance, making it well adapted to cultivation in northeastern China. It can be propagated via division during spring and autumn, with a recommended planting spacing of 40 × 40 cm. Before planting, the soil should be thoroughly irrigated. This cultivar demonstrates minimal susceptibility to pests and diseases.

Table 1. Morphological characteristics of ‘Zi Yuanwu’ and its parents.

Traits[i]	‘Zi Yuanwu’	*I. sanguinea*	*I. sanguinea* f. *albiflora*
Plant height (cm)	59.28 ± 0.15 a	56.64 ± 0.15 b	57.44 ± 0.15 b
Leaf length (cm)	56.07 ± 1.65 b	57.91 ± 0.82 a	56.39 ± 0.61 b
Leaf width (cm)	1.36 ± 0.07 a	1.25 ± 0.03 b	1.25 ± 0.04 b
Leaf length/width	41.32 ± 1.79 b	46.43 ± 1.61 a	45.30 ± 1.67 a
Bract length (cm)	5.83 ± 0.24 b	6.28 ± 0.09 a	6.13 ± 0.05 a
Bract width (cm)	1.04 ± 0.16 a	1.07 ± 0.05 a	1.08 ± 0.06 a
Bract length/width	5.69 ± 0.66 b	6.28 ± 0.09 a	5.67 ± 0.27 b
Flower diameter (cm)	6.35 ± 0.18 b	6.69 ± 0.05 a	6.66 ± 0.06 a
Inner perianth length (cm)	5.47 ± 0.13 a	4.37 ± 0.07 c	4.54 ± 0.08 b
Inner perianth width (cm)	3.14 ± 0.08 a	1.47 ± 0.12 b	1.48 ± 0.06 b
Inner perianth length/width	1.75 ± 0.03 b	3.04 ± 0.14 a	3.08 ± 0.10 a
Outer perianth length (cm)	7.01 ± 0.19 a	4.85 ± 0.06 b	4.91 ± 0.10 b
Outer perianth width (cm)	5.19 ± 0.08 a	1.75 ± 0.09 c	2.42 ± 0.08 b
Outer perianth length/width	1.35 ± 0.02 c	2.78 ± 0.16 a	2.03 ± 0.06 b
Flower period	5 Jun–25 Jun	5 Jun–25 Jun	5 Jun–25 Jun
Fruit period	10 Aug–20 Sep	10 Aug–20 Sep	10 Aug–20 Sep

[i] Data were collected in 2020–22 and analyzed using IBM SPSS Statistics 26.0 with a one-way analysis of variance. Different letters in the same row denote significant differences ($P < 0.05$).

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Fig. 1. Anatomical structures of 'Zi Yuanwu', *I. sanguinea* f. *albiflora*, and *I. sanguinea*. (**A**) Flowers of 'Zi Yuanwu'. (**B**) Flowers of *I. sanguinea*. (**C**) Flowers of *I. sanguinea* f. *albiflora*. (**D**) Flower anatomical structures of 'Zi Yuanwu'. (**E**) Flower anatomical structures of *I. sanguinea* f. *albiflora*. (**F**) Flower anatomical structures of *I. sanguinea*.

Habit and Application

'Zi Yuanwu' is characterized by large blooms, tall stature, resilience to low-maintenance practices, and strong adaptability, making it ideal for landscaping in cold regions and phytoremediation of water bodies.

Availability

Inquiries about research or request for 'Zi Yuanwu' can be directed to Dr. Ling Wang (e-mail: wanglinghlj@126.com) at the College of Landscape Architecture, Northeast Forestry University, Harbin, China.

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